

Name: \_\_\_\_\_

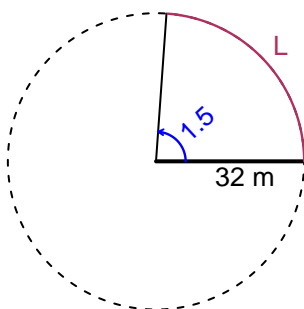
Date: \_\_\_\_\_

## Trig Final (TEST v612)

- You can use a calculator (like [Desmos](#))
- You should have a unit-circle with special angles and coordinates marked.

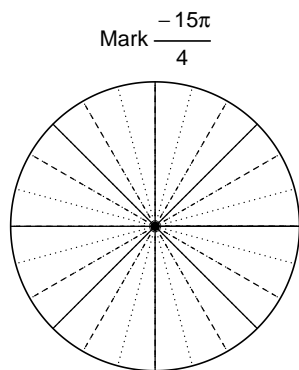
### Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The angle measure is 1.5 radians. The radius is 32 meters. How long is the arc in meters?

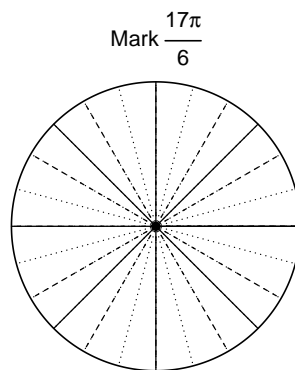


### Question 2

Consider angles  $-\frac{15\pi}{4}$  and  $\frac{17\pi}{6}$ . For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for  $\sin\left(-\frac{15\pi}{4}\right)$  and  $\cos\left(\frac{17\pi}{6}\right)$  by using a unit circle (provided separately).



Find  $\sin(-15\pi/4)$



Find  $\cos(17\pi/6)$

**Question 3**

If  $\tan(\theta) = \frac{40}{9}$ , and  $\theta$  is in quadrant III, determine an exact value for  $\cos(\theta)$ .

**Question 4**

A mass-spring system oscillates vertically with a frequency of 6.29 Hz, a midline at  $y = -2.99$  meters, and an amplitude of 7.57 meters. At  $t = 0$ , the mass is at the maximum height. Write an equation to model the height ( $y$  in meters) as a function of time ( $t$  in seconds).